AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of ~~determining optimal annealing conditions for a semiconductor material comprising~~ enhancing the properties of a semiconductor, the method comprising annealing a base material which is produced using As ion implantation at a temperature T to form the semiconductor, the temperature T being 475°C. or less and determined by:

obtaining a first set of values indicative of resistivity of the material for a plurality of annealing temperatures;

obtaining a second set of values indicative of carrier lifetime of the material for a plurality of annealing temperatures; and

comparing the first and second set of values to determine an annealing temperature or a range of annealing temperatures where the carrier lifetime and the resistivity of the material are optimized.

2. (Previously Presented) The method of claim 1, further comprising: determining an optimum annealing duration for the material.

3. (Currently amended) The method of claim 2, wherein ~~the material contains As, and~~ the optimum annealing duration is determined by obtaining a third set of values indicative of arsenic concentration of the material for a plurality of annealing durations and for at least one annealing temperature; comparing the at least one third set of values with the first and second sets of values to determine an annealing duration and an annealing temperature which together optimize the carrier lifetime and the resistivity of the material.

4. (Canceled).

5. (Currently amended) The method of ~~claim 4~~ claim 1, wherein the ~~characteristic~~ properties enhanced include ~~includes~~ carrier lifetime and resistivity.

6. (Currently amended) A method of producing a semiconductor material with photoconductive properties, the method comprising annealing the base material at a temperature of 475°C. or less so as to enhance the carrier lifetime of the material and the resistivity ~~restivity~~ of the material for use as a photoconductor, the temperature being determined according to the method of claim 1.

7. (Currently amended) The method of ~~claim 4~~ claim 1, wherein the annealing occurs at a temperature in the range of 250°C. and 450°C.

8. (Currently amended) The method of ~~claim 4~~ claim 1, wherein the base material is grown using molecular beam epitaxy.

9. (Canceled).

10. (Currently amended) The method according to ~~claim 4~~ claim 1, wherein the base material is formed in a growth chamber and annealing occurs outside the growth chamber.

11. (Currently amended) The method according to ~~claim 4~~ claim 1, wherein the semiconductor is a Group III-V semiconductor with photoconductive properties.

12. (Currently amended) The method according to ~~claim 4~~ claim 1, wherein the semiconductor comprises As.

13. (Currently amended) The method according to ~~claim 4~~ claim 1, wherein the base material is GaAs.

14. (Previously Presented) The method according to claim 13, wherein the wherein the GaAs is grown in a molecular beam epitaxy reactor at a temperature in the range of approximately 200°C. to 300°C.

15. (Currently amended) The method according to ~~claim 4~~ claim 1, wherein the base material is InGaAs.

16. (Previously Presented) The method of claim 15, wherein the base material is annealed at a temperature in the range of 350°C. to 450°C.

17. (Currently amended) The method according to ~~claim 4~~ claim 1, wherein the annealing is performed for fifteen minutes or less.

18. (Previously Presented) A semiconductor material formed using the method of claim 1.

19. (Canceled).

20. (Previously Presented) A photoconductive emitter comprising the semiconductor material of claim 18.

21. (Previously Presented) The emitter of claim 16, wherein the emitter is configured to emit terahertz radiation formed using a method according to claim 1.

22. (Previously Presented) A photoconductive receiver comprising the semiconductor material of claim 18.

23. (Previously Presented) The receiver of claim 22, wherein the receiver is configured to receive terahertz radiation.

Claims 24-29. (Canceled)